V2426 Series

x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots

- Intel Atom N270 1.6 GHz processor
- Up to 2 GB DDR2 533 SODIMM RAM
- Dual independent displays (VGA + DVI-I)
- 2 M12 Fast Ethernet ports, 10/100 Mbps
- 3 USB 2.0 ports for high speed peripherals
- 6 Digital Inputs, 2 Digital Outputs
- 1 CompactFlash slot for storage expansion
- 1 internal SATA-II storage drive bus
- 2 peripheral expansion slots for adding various modules
- Compliant with EN 50121-4 and essential sections of EN 50155
- Ready-to-run Debian Linux 5.0, Windows Embedded Standard 2009, or Windows Embedded Standard 7 platform
- -40° to 70°C wide temperature models available

Overview

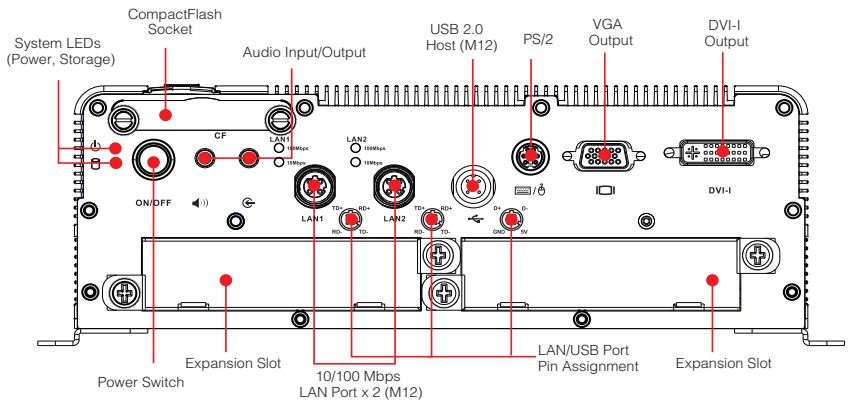
The V2426 Series embedded computers are based on the Intel Atom N270 x86 processor, and feature 4 RS-232/422/485 serial ports, dual LAN ports, 3 USB 2.0 hosts, and provide VGA and DVI-I outputs. In addition, V2426 Series computers are compliant with the essential sections of EN 50155 covering operating temperature, power input voltage, power surges, ESD, and vibration, making them particularly well-suited for railway and industrial applications.

The dual 10/100 Mbps Ethernet ports with M12 connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the V2426 computers have 6 DIs and 2 DOs for connecting digital input/output devices. In addition, the CompactFlash socket, SATA connector, and USB sockets provide the V2426 computers with the reliability needed for industrial applications that require data buffering and storage expansion. Moreover, the V2426 computers come with 2 peripheral expansion slots for inserting different communication modules, such as a 2-port CAN module, an HSDPA, GPS, WLAN module, an 8+8 port digital input/output module, a 2-port serial module, a mini PCI expansion module, and a mini-PCI Express module, giving greater flexibility for setting up different industrial applications at field sites.

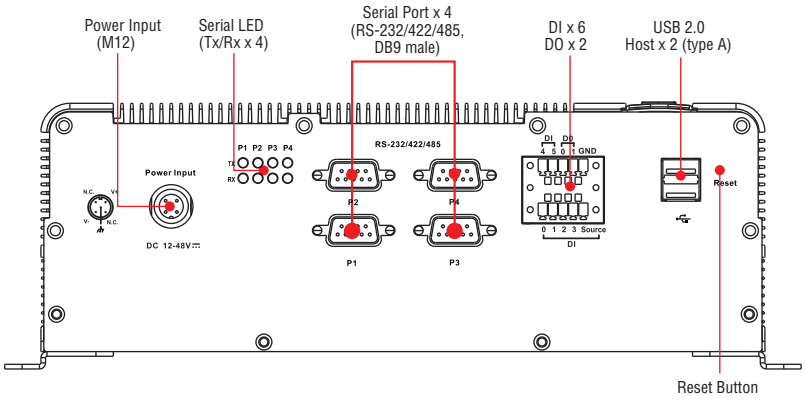
Pre-installed with Linux, Windows Embedded Standard 2009, or Windows Embedded Standard 7, the V2426 Series provides programmers with a friendly environment for developing sophisticated, bug-free application software at a low cost. Wide temperature models of the V2426 Series that operate reliably in a -40 to 70°C operating temperature range are also available, offering an optimal solution for applications subjected to harsh environments.

Appearance

Front View



Rear View



Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz processor
OS (pre-installed): Debina 5 ("Lenny"), Windows Embedded Standard 2009, or Windows Embedded Standard 7
System Chipset: Intel 945GSE + ICH7-M
BIOS: 8 Mbit PLCC, with ACPI
FSB: 533 MHz
System Memory: 2 GB capacity, 1 GB (LX and XPE models)/2 GB (W7E models) pre-installed: 1 slot of 200 pin SO-DIMM SDRAM
Expansion Bus: PCI interface reserved
USB: 3 bootable USB 2.0 ports: 2 type A, 1 M12

Storage

Built-in: 2 GB (LX and XPE models)/8 GB (W7E models) onboard industrial DOM to store OS
Storage Expansion: 1 type I/II CompactFlash slot for memory expansion
HDD Support: 1 internal SATA-II bus for mass storage
Expansion Slot: 2 peripheral expansion slots

Other Peripherals

Audio: Line-in, line-out interface
KB/MS: 1 PS/2 interface; supports keyboard and mouse via a Y cable

Display

Graphics Controller: Intel Generation 3.5 Integrated Graphics Engine, 250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage
VGA Interface: DB15 female connector, QXGA 2048 x 1536 resolution
DVI Interface: DVI-I connector (Chrontel CH7307 SDVO to DVI transmitter), up to 1600 x 1200 resolution

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps M12 ports
Magnetic Isolation Protection: 1.5 kV

Serial Interface

Serial Standards:
4 RS-232/422/485 ports*, software selectable (DB9 male)
*COM1's pin 9 signal can be set by jumper as N/C (default), +5 V, or +12 V
ESD Protection: 8 kV for all signals

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Digital Input

Input Channels: 6, source type
Input Voltage: 0 to 30 VDC at 25 Hz
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (Source to DI)
Isolation: 3 kV optical isolation

Digital Output

Output Channels: 2, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 VDC
Connector Type: 10 pin screw-fastened Euroblock terminal (6 inputs, 2 outputs, DI Source, GND)
Isolation: 3 kV optical isolation

LEDs

System: Power, Storage
LAN: 2 on each port: 10 Mbps & 100 Mbps
Serial: 2 on each serial port: 1 Tx & 1 Rx

Switches and Buttons

Power Switch: on/off (front panel)
Reset Button: For warm reboot (rear panel)

Physical Characteristics

Housing: Aluminum
Weight: 4 kg
Dimensions:
Without ears: 154 x 250 x 86 mm (6.06 x 9.84 x 3.39 in)
With ears:154 x 275 x 92 mm (6.06 x 10.83 x 3.62 in)
Mounting: DIN rail, wall, VESA

Environmental Limits

Operating Temperature:
Standard models: -25 to 60°C (-13 to 140°F)
Wide temp. models: -40 to 70°C (-40 to 158°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-vibration: EN 50155 standard
Anti-shock: EN 50155 standard
Conformal Coating: Available on request

Power Requirements

Input Voltage: 12 to 48 VDC (M12 connector)
Note: Compliant with EN 50155 on 24 VDC
Power Consumption: 48 W
• 4 A @ 12 VDC
• 2 A @ 24 VDC
• 1 A @ 48 VDC

Standards and Certifications

Safety: UL 60950-1, CSA C22.2 No. 60950-1-03, EN 60950-1
EMC: EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class A
Rail Traffic: EN 50155, EN 50121-3-2, EN 50121-4, IEC 61373
Green Product: RoHS, CRoHS, WEEE

Reliability

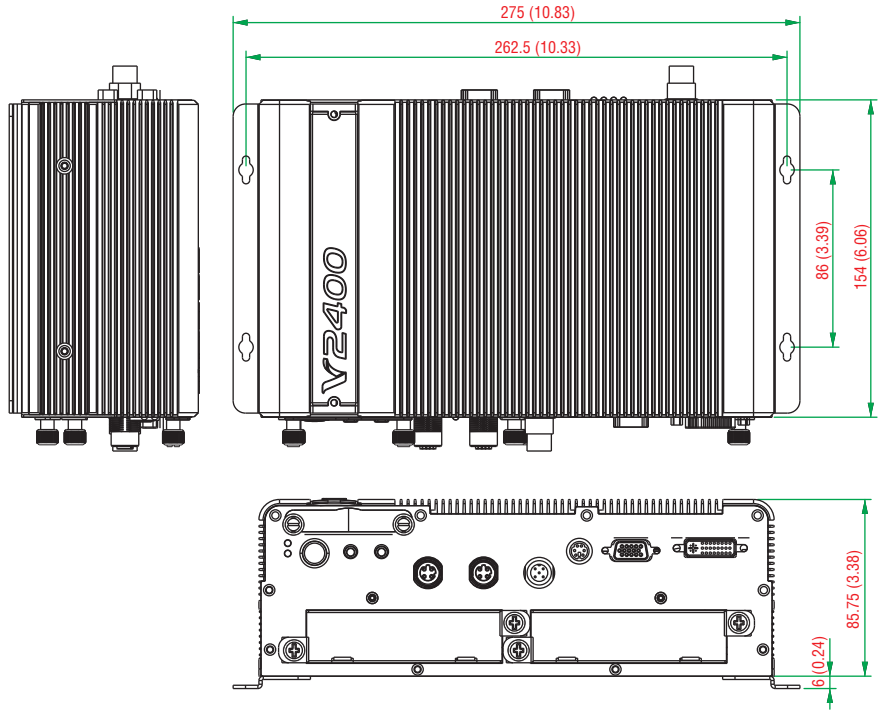
Automatic Reboot Trigger: Software-programmable watchdog timer configurable from 1 to 255 seconds
MTBF (mean time between failures): 192,308 hrs

Warranty

Warranty Period: 3 years
Details: See www.moxa.com/warranty
Note: These hardware specifications describe the embedded computer unit itself, but not its official accessories. In particular, the wide temperature specification does not apply to accessories such as power adaptors and cables.

Dimensions

Unit: mm (inch)



Software Specifications

Linux

OS: Debian Linux 5.0, “Lenny”, kernel 2.6.32
File System: EXT2
Internet Protocol Suite: TCP, UDP, IPv4, SNMPv1/v2c/v3, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, TFTP, PPP, PPPoE
Internet Security: OpenVPN, iptables firewall
Web Server (Apache): Allows you to create and manage web sites; supports PHP and XML
Terminal Server (SSH): Provides secure encrypted communications between two un-trusted hosts over an insecure network
Dial-up Networking: PPP Daemon for Linux that allows Unix machines to connect to the Internet through dialup lines, using the PPP protocol, as a PPP server or client. Works with ‘chat’, ‘dip’, and ‘diald’, among (many) others. Supports IP, TCP, UDP, and (for Linux) IPX (Novell).
File Server: Enables remote clients to access files and other resources over the network
Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Moxa API provided)
Application Development Software:
• Moxa API Library (Watchdog timer, Moxa serial I/O control, Moxa DI/DO API)
• GNU C/C++ compiler
• GNU C library
• Perl

Windows Embedded Standard 7

Core OS:
• 32-bit support
• Remote Client
• Remote Procedure Call
Applications and Services Development:
• .Net Framework 3.5
• Remote Desktop Protocol 7.1
• COM OLE Application Support
• COM+ Application Support
• MSMQ
Internet Services:
• Internet Explorer 8.0
• IIS 7.0
File Systems and Data Store:
• Windows Data Access Components
• Windows Backup and Restore
Diagnostics:
• Common Diagnostic Tools
• Problem Reports and Solutions
Fonts: Chinese (Trad. and Simp.), Japanese, Korean, Western, Middle Eastern, South East Asian, and South Asian Fonts
Graphics and Multimedia:
• MPEG DTV-DVD Audio Decoder (MPEG-2, AAC)
• MPEG Layer-3 Audio Codecs(MP3)

• MPEG4 Decoders
• Windows Media Video VC-1 (WMV) Codecs
• DirectX and Windows Device Experience
• Windows Media Player 12

Management:
• Group Policy Management
• Windows Management Instrument (WMI)
• Windows Update

Networking:
• Extensible Authentication Protocol (EAP)
• Internet Authentication Service
• Telnet Server
• Bluetooth
• Domain Services
• Network Access Protection
• Network and Sharing Center
• Quality of Service
• Remote Access Service (RAS)
• Telephony API Client
• Windows Firewall
• Wireless Networking

Security:
• Credential Roaming Service
• Credentials and Certificate Management
• Windows Authorization Manager (AZMAN)
• Windows Security Center
• Active Directory Rights Management
• Security Base
• Encrypted File System (EFS)

Embedded Features:
• Enhanced Write Filter (EWF)
• File-Based Write Filter (FBWF)
• Message Box Default Reply
• Registry Filter
• WSDAPI for .NET

Windows XP Embedded

OS: Windows Embedded Standard 2009 SP3
File System: NTFS
Internet Protocol Suite: DHCP, DNS, FTP, HTTP, SNTP, NTP, Telnet, SMTP, SNMPv2, TCP, UDP, IPv4, ICMP, IGMP, IPsec, TAPI, ICS, PPP, CHAP, EAP, PPPoE, PPTP, NetBIOS
Web Server (IIS): Allows users to create and manage websites
Silverlight 2.0: Silverlight is a powerful development tool for creating engaging, interactive user experiences for Web and obile applications using the .NET framework.
Remote Registry Service: Enables remote users to modify registry settings on this computer
Remote Desktop: The Terminal Server Remote Desktop component provides remote access for the desktop of a computer running Terminal Services
Watchdog: Features a hardware function to trigger system reset in a user specified time interval up to 60 seconds (Moxa API provided)
Enhanced Writer Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
File Based Write Filter: The File Based Write Filter (FBWF) component redirects all write requests directed at protected volumes to the overlay cache, which records and displays the changes while preserving the protected status of the target volume.

Application Development Software:
• Moxa API Library
• Microsoft .Net Framework 3.5 with SP1
• Active Directory Service Interface (ADSI) Core
• Active Template Library (ATL), ASP.NET 2.0
• Common Control Libraries
• Common File Dialogs
• Direct3D, DirectPlay, DirectShow, and Direct show filters
• Mapi32 Libraries
• Message Queuing (MSMQ) Core
• Microsoft Visual C++ Run Time Libraries
• Power Management dynamic-link library
• RPC
• Windows API, Script Engines, and WMI

Ordering Information

Available Models

V2426-XPE: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Windows Embedded Standard 2009, -25 to 60°C operating temperature (EN 50155 Class T1)
V2426-LX: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Debian Linux 5.0 “Lenny”, -25 to 60°C operating temperature (EN 50155 Class T1)
V2426-W7E: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Windows Embedded Standard 7, -25 to 60°C operating temperature (EN 50155 Class T1)
V2426-T-XPE: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Windows Embedded Standard 2009, -40 to 70°C operating temperature (EN 50155 Class TX)
V2426-T-LX: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Debian Linux 5.0 “Lenny”, -40 to 70°C operating temperature (EN 50155 Class TX)
V2426-T-W7E: x86 ready-to-run embedded computer with Intel Atom N270 CPU, VGA, DVI-I, audio, 2 Ethernet LAN ports, 4 serial ports, 6 DIs, 2 DOs, 3 USB 2.0 ports, 1 CompactFlash slot, 2 peripheral expansion slots, Windows Embedded Standard 7, -40 to 70°C operating temperature (EN 50155 Class TX)
Note: Conformal Coating is available on request.

Expansion Modules (can be purchased separately)

EPM-3112: 2 isolated CAN ports, DB9 connector
EPM-3337: HSDPA, GPS, WLAN (11a/b/g/n)
EPM-3438: 8+8 DI/DO with 3 kV digital isolation protection, 2 KHz counter
EPM-3032: 2 isolated RS-232/422/485 ports with DB9 connectors
EPM-DK01: 1-slot mini PCI and mini PCIe expansion module
EPM-3552: 1 VGA or DVI-I display connector

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adapter
PWC-C7US-2B-183: Power cord with 2-pin connector, USA plug
PWC-C7EU-2B-183: Power cord with 2-pin connector, Euro plug
PWC-C7UK-2B-183: Power cord with 2-pin connector, British plug
PWC-C7AU-2B-183: Power cord with 2-pin connector, Australia plug
PWC-C7CN-2B-183: Power cord with 2-pin connector, China plug
DK-DC50131-01: DIN rail mounting kit
FK-75125-02: Hard disk installation package (for HDD, SSD, EN 50155)

M12 Connectors (can be purchased separately)

M12A-5P-IP68: Field-installation A-coded screw-in power connector, 5-pin female M12 connector, IP68-rated
M12D-4P-IP68: Field-installation D-coded screw-in Ethernet connector, 4-pin male M12 connector, IP68-rated
M12A-5PMM-IP68: D-coded screw-in USB connector, 5-pin male M12 connector, IP68-rated

M12 Cables (can be purchased separately)

CBL-M12(FF5P)/Open-100 IP67: 1-meter A-coded M12-to-5-pin power cable, 5-pin female M12 connector, IP67-rated
CBL-M12D(MM4P)/RJ45-100 IP67: 1-meter D-coded M12-to-RJ45 Cat-5C UTP Ethernet cable, 4-pin male M12 connector, IP67-rated

Package Checklist

- V2426 embedded computer
- PS2 to KB/MS Y-type cable
- Documentation and software CD or DVD
- Quick installation guide (printed)
- Warranty card

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